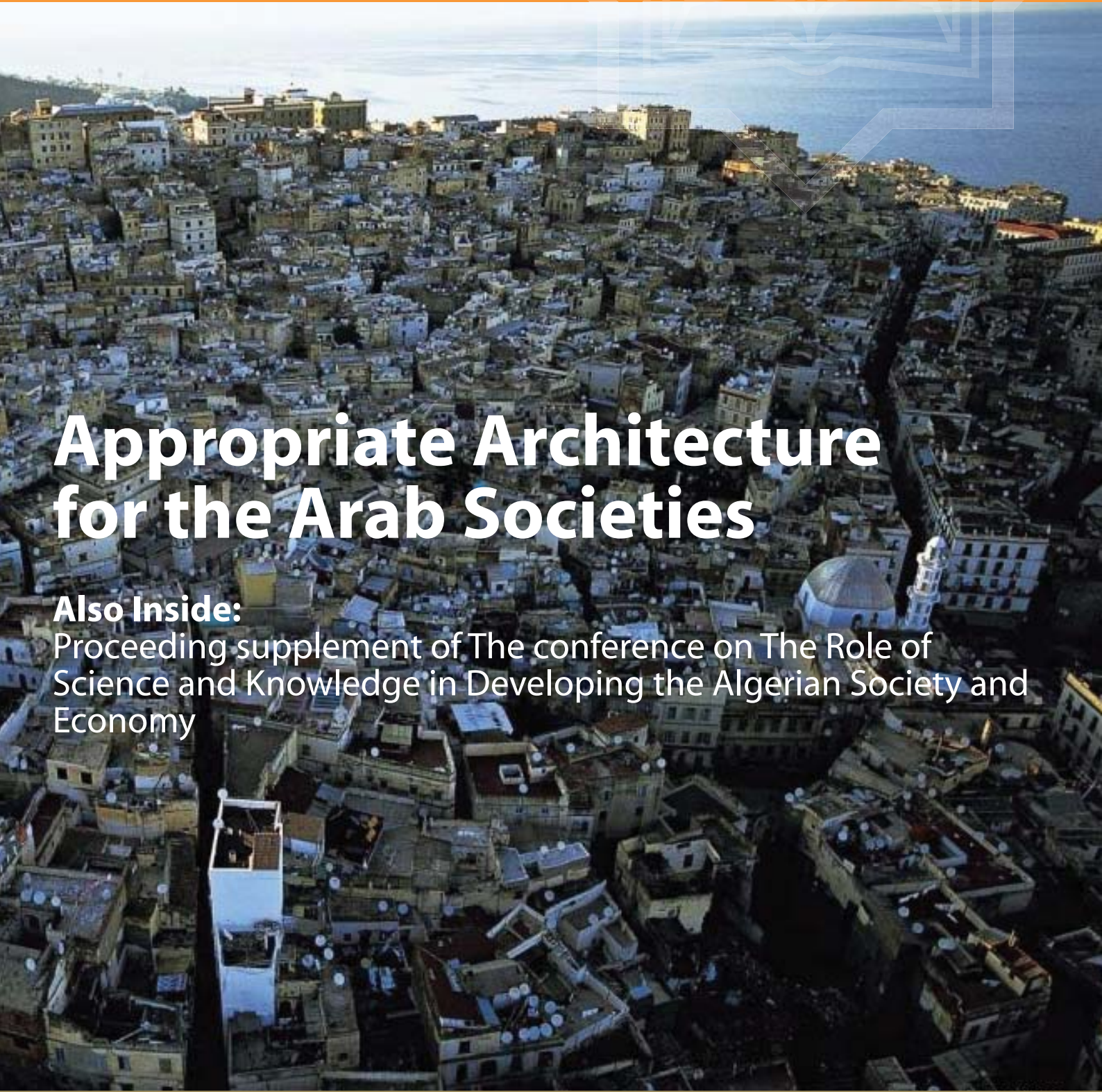


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IBSscientific

M A G A Z I N E



Appropriate Architecture for the Arab Societies

Also Inside:

Proceeding supplement of The conference on The Role of Science and Knowledge in Developing the Algerian Society and Economy

Volume 3 Number 1 | March 2007

IBSscientific

M A G A Z I N E

O P E N A C C E S S

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The Casbah, citadel, has always been the beating heart of Algiers, capital of Algeria. It managed to preserve its original oriental architecture and it is classified as an official World Heritage Site. (<http://www.yannarthusbertrand.com>)

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"None of us is as smart as all of us"

Tapping the hidden dimension of human intelligence: collective wisdom for collective action.

Being smart has traditionally been associated with people of quick wit, of great awareness, of uncontested intelligence. Some think of genius of 20th century science, or national heroes in the arts, literature of even first class athletes. Another illustration, this years' Time Magazine editors chose YOU as their personality of the year¹.

However, as in every reality of life, there is always another side to true meanings. It is another dimension of our intelligent being, it is another resource of wisdom, another way doing and creating things. It is the wisdom of collective genius. That is why our vote would be for YOU, the plural not the singular.

In a global society like the one we find ourselves living in, advances in technology and access to timely information is the most important commodity. Human empowerment is at its highest yet in all but small cases one is too small to create greatness. Collaboration is not simply desirable it is inevitable.

Throughout history, groups of smart talented people, often without conscious design, have successfully blended individual and collective efforts to create something new and wonderful. From medieval England, Oxford and Cambridge colleges are just the result of collective work by a number of scholars. The word college itself, means a group of colleagues, comrades, friends who share a common belief and a common objective. Nowadays, the Human Genome project is an illustration of the power of collective action and collaboration.

This is a call to everyone, to those who are compassionate, to those who aim beyond their own selfish desires, to those who genuinely want to improve things. If you have an idea, start talking about it, throw it in the air, you will never know who may pick it up. Using your own initiative, and determination, you will find people across your road, in the next campus, in an adjacent city or even in another continent., who can bring valuable insights, experience and ideas to anything you do.

Working together, visions start to unveil, perspective, meaning and value will be added to what you do. Moreover, things will have more impact. And remember that anyone can make

a difference, and “if you think you are too small, then you have never been in bed with a mosquito”². With character and vision, you will reinvent yourself and instead of struggling to fit in, you will learn how to stand out.

This is not blind optimism, we all remember the horrors of working in a group, remember the slackers, the free riders, the ignorant, the absent minded and so on. There is something more substantial. For a group to create greatness, it needs to challenge habits, structures, to set aside selfish pride and strive to listen and take on board criticism for the genuine desire to improve things. When you look back in history remember that it's always a small group of thoughtful committed people who have changed the world. Think of the Group of 22.

So, let's get talking³, let's get connected, let's team up and enjoy the ride together.

In this issue of IBScientific magazine, we have great articles for you. Mr Fardeheb will tap on one of the fundamental problems societies in North Africa. Currently, housing shortages are acute in Morocco, Algeria and Egypt and it is often a subject of hot political debate. Mr Fardeheb will present ideas on how to forge ties between architecture as a tool for artistic and esthetic expression, urban culture and the options and opportunities modern technologies provide to tackle such problems.

Enjoy the issue

Mohamed Ali Teffahi
IBScientific Board Member

¹ Time Magazine, December 2006

² Anita Rodick, founder of the Body Shop

³ A. Kaidi, IBScientific Journal of Science 1(2)





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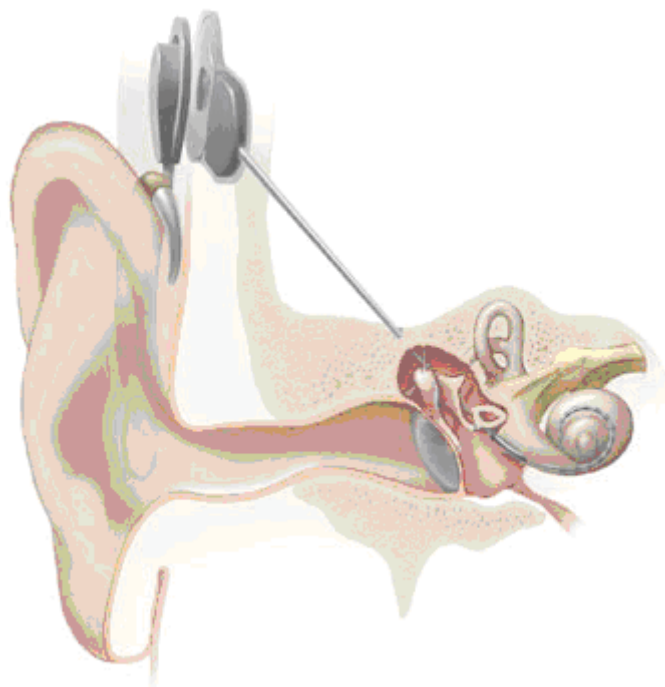
An Algerian Minister visits CERN

The Algerian Minister of Higher Education and Scientific Research, Rachid Haraoubia, visited CERN on 14 November. His party included the Rector of the University of Blida and the Director of the Algerian Ecole Nationale Polytechnique. Welcomed by CERN's Director-General, Robert Aymar, and Secretary-General, Maximilien Metzger, he signed the VIP Visitors' Book before going on to visit the ATLAS experiment and the LHC tunnel. He then had the opportunity to meet Algerian scientists working at CERN.

Some fifteen Algerian physicists attached to European and US institutes are participating in the LHC experiments, in particular ATLAS. A formal collaboration agreement between Algeria and CERN is expected to be drawn up in the near future.

Source:

MAT. <http://cdsweb.cern.ch/search?recid=1001238>



Medicine

First transplant of cochlear implants undertaken by Algerian surgeons

Algiers - The grafts of cochlear implants have been carried out Monday at the hospital of Kouba, Algiers, on five children aged between 14 months and 6 years, after many months of medical follow-up and courses in orthophony. This surgery has been undertaken by Pr. Nadia

Yahi Ait Mesbah, a specialist in otorhinolaryngology at the aforementioned hospital, assisted by Pr. Djamel Djenaoui, also a specialist in ENT, as well as the head of Mustapha Pacha teaching hospital and assistants and specialists from the Algerian association of private doctors.

A cochlear implant (CI) is a surgically implanted electronic device that can help provide a sense of sound to a person who is profoundly deaf or severely hard of hearing. The cochlear implant is often referred to as a bionic ear. Unlike other kinds of hearing aids, the cochlear implant does not amplify sound, but works by directly stimulating any functioning auditory nerves inside the cochlea with electrical impulses. External components of the cochlear implant include a microphone, speech processor and transmitter.

An implant does not restore or create normal hearing. Instead, under the appropriate conditions, it can give a deaf person a useful auditory understanding of the environment and help them to understand speech, although post-implantation

therapy is always required. According to researchers at the University of Michigan, approximately 100,000 people worldwide have received cochlear implants; roughly half are children and half adults. The vast majority are in developed countries due to the prohibitive cost of the device, surgery and post-implantation therapy — Mexico had performed only 55 cochlear implant operations by the year 2000.

Sources:

MAT. APS, www.aps.dz and Wikipedia, www.wikipedia.org.

Health

Engineering Sight



Major advances achieved by researchers in the U.S. Department of Energy's (DOE) Artificial Retina Project are beginning to offer some hope to millions of people blinded by retinal diseases worldwide.

In a breakthrough operation performed by project leaders at the Doheny Eye Institute (University of Southern California) in 2002, doctors threaded an electrode-studded array through an incision into the eye of a man who had been blind for 50 years and tacked it onto his damaged retina. Within weeks, the 77-year-old patient could see patterns of light and dark that al-

lowed him to detect motion and locate and differentiate simple objects. For the first time in half a century he could also envision a brighter future for himself and others whose lives have been devastated by vision loss due to retinal disease.

In fact, subjects are able to tell the difference between objects such as a cup, a plate and a knife. They can also tell which direction objects are moving in front of them. The brain seems to be able to fill in a lot of the missed information.

The device, in the early stages of human clinical testing, is part of

a new class of so-called “smart” prostheses that link with the brain and nervous system to restore function lost to disease or injury.

The Bionic Eye

Normal vision begins when light enters and moves through the eye to strike specialised photoreceptor (light-receiving) cells in the retina called rods and cones. These cells convert light signals to electric impulses that are sent to the optic nerve and the brain. Retinal diseases like age-related macular degeneration and retinitis pigmentosa destroy the photoreceptor cells. The arti-

ficial retina device bypasses these cells to transmit signals directly to the optic nerve.

The device consists of a tiny camera and microprocessor mounted in eyeglasses, a receiver implanted behind the ear, and an electrode-studded array that is tacked to the retina. A wireless battery pack worn on the belt powers the entire device.

The camera captures an image and sends the information to the microprocessor, which converts the data to an electronic signal and transmits it to the receiver. The receiver sends the signals through a tiny cable to

the electrode array, stimulating it to emit pulses. The pulses travel through a tiny cable to the electrode array, stimulating it to emit pulses. The pulses travel through the optic nerve to the brain, which perceives patterns of light and dark spots corresponding to the electrodes stimulated. Patients learn to interpret the visual patterns produced.

Sources:

MAT. The the Doheny Eye Institute, <http://www.doheny.org> and AAAS 2007 Annual Meeting News, <http://news.aaas.org/index.php/page/3/>

Islamic geometry excellence unveiled through the perfection of symmetry

Medieval Muslim geometers and architects created ceramic tiles using geometry not understood in the west until the late 1970s, a new study reveals

Mohamed Ali TEFFAHI

Cambridge University
United Kingdom

Artistic and aesthetic expression are one of the most cherished traditions in Islamic cultures. In architectural expression, Muslims' heritage is world renowned from the Al Hambra in Andalusia to the Umayyad Mosques in Damascus. From the minarets of the Bleu mosque in Istanbul to the amazing madrasas in Burakha and Tashkent in central Asia.

In Islam, painting in living form is forbidden, any form of pictorial decoration is not permitted; it is considered as a human challenge to God's creation. Nonetheless, Muslims have managed to express their faiths using art. It was through the abstract language of mathematics. Muslim made major contributions in mathematics over the centuries, no one denies the work of the likes of Al-Khawarizmi, Al-Kindi and more. Geometry is one of those mathematical tools that have been used by Muslims to create complex

artistic forms and shapes in a pursuit of perfection.

Medieval Islamic mosques, palaces and other buildings were routinely covered in ornate tile work. These geometric patterns, called *girih* in Arabic, inscribe stars and other shapes (see figures).

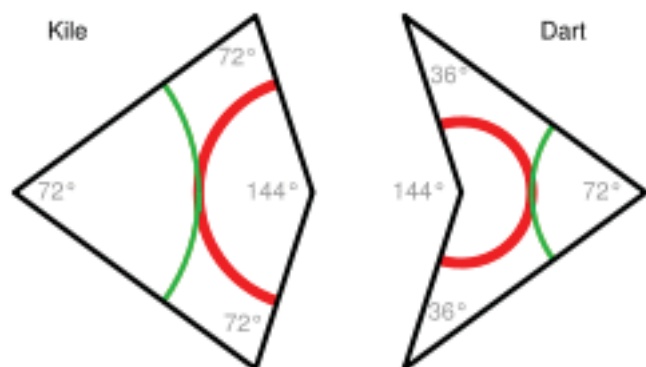
Lu and Steinhardt (1) find that by the beginning of the 13th century, artisans began to create these patterns from tilings of decorated polygons. One particular example, the Darb-i Imam shrine in Isfahan, Iran, which dates to A.D. 1453, is covered in a symmetric pattern of pentagons and 10-sided stars. If extended indefinitely in all directions, the researchers say, it would never repeat itself—the hallmark of a quasicrystal.

When some people first look at a quasicrystal pattern, Steinhardt says, they immediately notice repeating motifs. These people assume the pattern is repeating in a regular way, like the tiles on a bathroom floor. Others see that the pattern repeats but not in a regular way, and they assume that it is random. In fact, the pattern isn't random. Steinhardt says if you do the math, you see that it all fits together in predictable way. But intuitively, it's hard for some people to see.

Penrose Tiles

The pattern is equivalent to the most famous example of a quasicrystal, the "Penrose tile", discovered in 1974 by Oxford mathematician and physicist Roger Penrose. He showed how to construct it by fitting two types of Penrose tiles edge to edge according to certain rules.

Figure 1: Kite and dart Penrose tiles.



Credit: R. Penrose, Oxford University



“Penrose” tiles are two simple geometric shapes, usually a kite and a dart or a fat and a skinny rhombus (diamond). When laid down in a tiling, these pairs of tiles can cover a plane in a pattern that never repeats.

As a “Penrose” tiling spreads across a larger and larger surface, the ratio between the numbers of each type of tile approaches the golden ratio (The golden ratio is the rational number $1 + \sqrt{5}/2 = 1.618 \dots$). Penrose tilings have five fold rotational symmetry, the same kind of a symmetry that a five-pointed star has. If you rotate the whole pattern by 72 degrees, it looks just the same.

Muslim Quasi-Crystals

The patterns on Islamic buildings had lots of pentagons, decagons, stars, and geometric figures with five fold symmetry. After inspecting thousands of images of different buildings, Lu found a picture of a 15th century architectural scroll from Istanbul, the Topkapi scroll, which was like the blueprint of for Muslim architects and craftsmen.

The main dark pattern of red and blue lines was very complex and non repeating. But underneath, he saw a fainter red pattern that broke the design into five decorated tiles, a decagon, a pentagon, a hexagon, a bowtie and a rhombus, just like a “Penrose”. This could explain how Muslim workers tiled just large building surfaces with such precision.

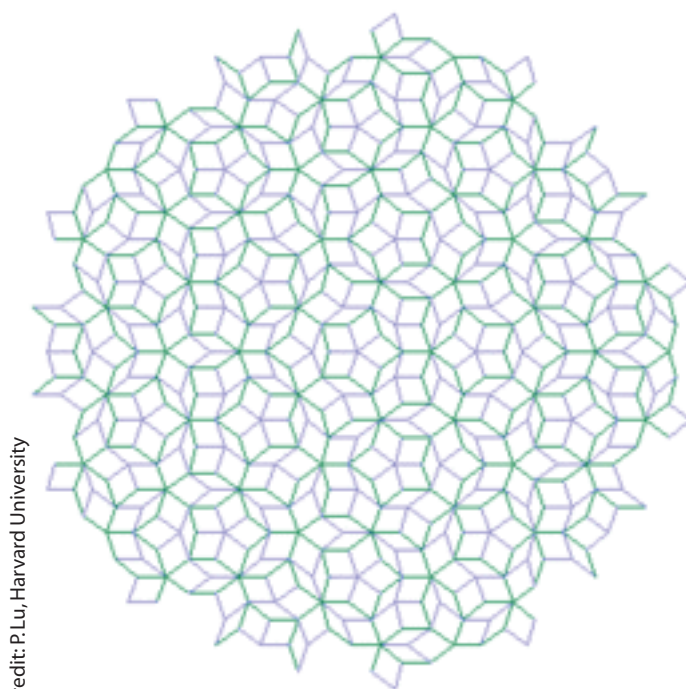
The Dar-i-Imam shrine was particularly remarkable because it showed girih tile patterns at two different scales, so that large girih tiles were broken up to smaller girih tiles. In principle, by repeatedly scaling up the tiling in this way, they could have covered an arbitrarily large wall with a Penrose tiling.

[1] Science (vol 315, p 1106)

Figure 3: A 15th-century Timurid-Turkmen scroll now held by the Topkapi Palace Museum in Istanbul.

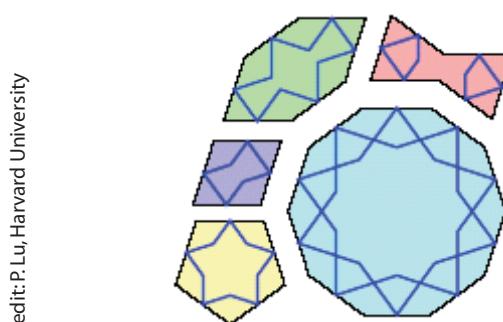


Credit: P. Lu, Harvard University



Credit: P. Lu, Harvard University

Figure 2: A Penrose tiling made up of fat and skinny diamonds.



Credit: P. Lu, Harvard University

Figure 4: The five decorated shapes.



Credit: W.B. Danny and P. Lu, Harvard University

Figure 5: Part of a girih-pattern tiling from a Turkish mosque, with its analysis in terms of three of the decorated blocks (bowtie, decagon and flat hexagon) used by Islamic geometers. The other two are a pentagon and our “fat rhombus.”

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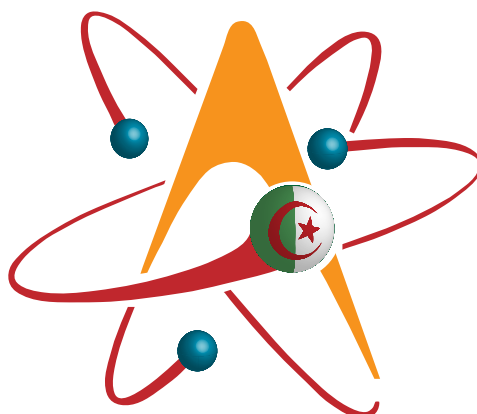
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The conference on

**The Role of Science and Knowledge in
Developing the Algerian
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Algiers, 16-18 April 2007

**Proceedings and
Proposals**

About the Conference

Undoubtedly, science and technology driven economy plays an increasing role in the growth and the development of any society. In recent years, Algeria is undertaking profound economical and social transformations to modernise the country and improve the living standards. These current changes open a wealth of opportunities to all Algerian scientists, intellectuals and professionals around the world to be involved in building an Algerian knowledgeable society and leading edge-economy.

To this end, we invite all Algerian competences from Algeria and abroad to participate in “The Role of Science and knowledge in Algeria’s economy and society” conference. This conference aims at establishing an international network of exchange between participants and enabling them to contribute in Algeria’s growth. The conference is co-organised by National Foundation for Health Progress and Research Development and IBScientific Publishing Group.

The conference will lay the foundation and disseminate best practices for science and technology initiatives to contribute into the Algerian innovationdriven economic development. It offers a unique opportunity to share your insight into strategies and methods available for convert research ideas into products and services in the marketplace.

The conference calls all Algerians sharing the same objectives and interested in the exploration of ideas for wealth creation to contribute to and benefit from these economical transformations. Speakers will present ideas and propose projects for scientific, technological and intellectual collaboration between

Algerians living abroad and their peers in Algeria. The Conference will also include discussions with speakers, official representatives and attendees to identify how the ideas and projects presented during the event can be accomplished. The proceedings of this conference will be published by IBScientific.



Abstracts in English

Research and education collaboration in Algeria: A blue print for success

Dr. Lakhdar BOUKERROU
Florida Atlantic University, USA

The collaboration between Algerian scientists living abroad and those working at Algerian based university is becoming more and more of a necessity. Although, there have been some modest attempts to promote such collaboration these efforts have not resulted in significant contributions. There are some isolated cases of collaboration but none have been institutionalized. It is widely recognized that collaboration in scientific research and education is very useful and should be encouraged. Thus, attention needs to be given to collaboration when considering university policies and funding in Algeria

The purpose of this paper is to present a “Blue Print” for creating an organization tasked with promoting collaboration between Algerian scientists in Algeria and abroad. Bringing these competencies together, under the umbrella of such an organization will stimulate research and education in Algeria.

The policies in Algeria should aim to improve the links between the two groups as well as promoting research and education collaboration across sectors and universities.

In promoting research and education programs, the new organization should aim at addressing the following questions:

- Is collaboration between individuals or institutions or both?
- What programs should be targeted for collaboration?
- How to measure the collaboration efforts?
- How are collaborative programs going to be funded?
- What is the role of the government institutions in promoting collaboration?
- How to motivate Algerians living abroad and in Algeria

to collaborate?

- Under what umbrella should collaboration occur?
- What are the benefits of collaboration?
- What are the implications of collaboration on the country's research and education policies?
- How does collaboration benefit the private sector?
- How does collaboration advance the scientific knowledge of the collaborators?

The proposed name for the new organization is “Algerian Academy of Science (AAS)” or “Academie Algerienne des Sciences” herein referred to as AAS. A non-profit organization, AAS will be based in Algeria with overseas regional branches located in the Americas, Asia, Europe, and Africa. It will be governed by a Board of Directors composed of 13 members, two from each region of the world and five from Algeria. AAS will comprise scientific committee composed of scientists living abroad and in Algeria. These committees will promote collaboration in their respective areas of responsibility. The make up of scientific committees should at least include the following:

- Engineering (mechanical, electrical, civil, etc.)
- Ecological Sciences (biology agriculture, environment, soil science)
- Education
- Social Sciences
- Physical Sciences (chemistry, physics, computer science, etc.)

Finally, this new organization should be put in place as soon as possible to address the challenges facing the Algerian scientists in Algeria. Its creation will also give a venue to Algerians abroad for participation in the advancement of science in Algeria.



KAFKAF R&D: The long desert crossing from England to Algeria

Abdelmalek BOUHADJERA

Electronics Department, Jijel University, Algeria

The story of this enterprise goes back to summer 1983. That time I had just got my BSc. degree in electronics and applied for a grant from the algerian government to study abroad.

One day, I was playing ping-pong with my brothers. While I was waiting for my turn, I started throwing a ping-pong ball against a wall. I hit it with the palm of my hand and when it bounces back from the wall I first returned it with the same hand, and after a while I started to use alternate hands...eureka!

I have just invented a new game!

I jumped with joy and told my brothers without explaining anything "just remember this moment, It might lead to something big".

Well, a long time has passed and I neither become rich nor famous, but I have since then been a very busy man: not only I fulfilled my childhood dreams about inventing something new, but I managed to put a product on the market starting from scratch as well.

The name "kaf-kaf" is coined from the two arabic words "kef" and "kora". Which mean palm and ball respectively. But the first letter in both arabic words is "k" which is called "kaf" in arabic, and hence the name KAFKAF for the new game, and PALMBALL in English.

Important dates:

- **1983, Jijel, Algeria.** The idea of Kafkaf (Palmball) started.
- **1983-1984, Birmingham University, England.** Making the first sketch and the first prototype of Palmball. The first rules are set.
- **1984-1988, Nottigham University, England.** Making the second prototype and applying for a patent application. The game was tested with students at the uinversity, and a video explaining the rules was made. Getting in touch with few companies in order to licence the game.
- **1990, Basingstoke, England.** The idea of El-Mishkak

came to me while I was thinking about writing a book related to the moderization of arabic language. The project of PalmBall was shelved and the design, manufacture and marketing of El-Mishkak started.

- **1991-1993, Basingstoke, England.** The first pre-production run of El-Mishkak was made, and the game was put on display at four book-stores in London, on sale-or-return basis. The first articles about the game were published in El-Sharq El-Awsat, Al-hayat and sayyidaty magazine in London. Also, the Algerian newspaper Al-Massa published daily a word-game based on El-Mishkak for a period of six months in 1991.
- **September 1993.** Returned back to Algeria.
- **1996.** Design of a popular version of El-Mishkak.
- **1998.** KAFKAF R&D is officially launched in Algeria with the aim of manufacturing and producing the popular version of El-Mishkak.
- **May 1999.** El-Mishkak is manufactured and distributed on the Algerian market.
- **2000.** Designed a new multilingual word-game called Words-War.
- **2002-.** Started the computer version of El-Mishkak, called Mishkak-PC, within the Dictionary Research Lab.

What this initiative is all about? New platform for future networking

Dr. Mohamed BOUDJELLAL

Professional, United Kingdom

Undoubtedly, science and technology driven economy plays an increasing role in the growth and the development of any society. Classical economic has recognized only two factors of production: labor and capital. This is now changing. Information and knowledge are replacing capital and energy as the primary wealth-creating assets, just as the latter two replaced land and labor 200 years



ago. High qualified human resource is the new capita and competitive advantage for any nation in the new global economy. Creating knowledge based economy start from the elementary school, embedded in middle and higher school, and incubated at the higher education. Internet resources related to the field of knowledge based economy and knowledge management in the new information society is the key enabler for the 21st economy.

In recent years, Algeria is undertaking profound economical and social transformations to modernise

the country and improve the living standards toward knowledge based economy (infonoutics). These current changes open a wealth of opportunities to all Algerian scientists, intellectuals and professionals around the world to be involved in building an Algerian knowledgeable society and leading edge-economy. My talk emphasis on the knowledge based economy, and how talent of how the Algerian Competences living in Algeria and abroad can get together to network and create platform of knowledge transfer toward Algeria.

IBScientific: the academic institution for publication, collaboration and the organisation of Algerian researchers

Dr. Abdelkader ESSAFI
IBScientific, United Kingdom

IBScientific is UK-based a non-governmental organisation to be registered as a charity and based , IBScientific celebrates its second anniversary today and has organised this conference in the memory of Cheikh Ibn Badis. The talk will introduce IBScientific as a unique scientific Platform that has proved its success outside Algeria. Aims and objectives of this young Institution include establishing a peer-reviewed publication platform of international standing to disseminate Algerian research, creating a collaboration database between Algerian scientists and their counterparts in other countries, as well as organising and managing general and specialised international conferences for the benefit of Algerian institutions and universities. The experience of the dynamic group of

IBScientific will also push in this conference for the creation of an Algerian academy of science, an idea supported by prominent scientists worldwide. The academy is an independent institution that play a role in promoting science in knowledge based society and economy. This presentation will give an introduction to the activities of IBScientific, and present an opportunity for anyone, any institution, any network, any society to take part in building the future knowledge based society around very solid projects. Also, the presentation will highlight some crucial factors that can improve Algerian Science and enhance scientific collaboration and hence build a solid science and technology infrastructure that can contribute in the development of The country's society and economy.

Fire Safety Engineering Design in Buildings

Ali NADJAI
Ulster University, United Kingdom

The role of the structural engineer regarding design for fire safety in buildings is concerned mainly with protection of the structure. Reasons for protection relate to two issues. Firstly,

that of life safety and secondly, that concerning reuse of the building after a fire event. Current thinking among professionals and regulatory bodies is that life safety is the most concern of insurance companies, although assessment of structural capacity post-fire falls into remit of the structural engineer. However, general fire engineering design encompasses many issues other than the structural protection, of which the structural engineer should be aware in order to place his own contribution to fire safety in context.



There are basically four types of Building fires possible in big cities:

- i) Accidental fires:* These are fires due to accidents, such as igniting a polyurethane sofa by an electric fault. The heat release rate is usually developed slowly, e.g. approximately 100 Kilowatts for 10 minutes.
- ii) Arson fires:* These fires are set up purposely by igniting sources such as gasoline, e.g. the Belfast Home base in 2006. The initial heat release rate might be high or low, dependant on intent of the arsonist, with consequences hard to predict.
- iii) Attack fires:* These might be due to military action or terrorist attack. The whole building might be destroyed within a short period of time by the explosions or resultant fire, e.g. the World Trade Centre, New York 2001. The heat release rate might reach thousands of megawatts.
- (iv) Fires due to natural disaster:* These are fires created by natural disasters such as earthquakes, e.g. the fires resulting from the 1995 Kobe-Osaka earthquake in Japan. A mass simultaneously-ignited fire on an urban scale might develop, or fire may spread from building to building, attenuated by strong winds.

The initial design requirement is the containment of a fire that is to compartmentise a building, so that, if a fire does start in any particular area or section, it is retained inside that particular area and does not spread to the rest of the building. The other design aspect is that of structural col-

lapse. Concerns regarding life safety are that of the immediate or short-term collapse of the structure, which inhibits or prevents means of escape, and then the collapse of compartment boundaries, which leads to spread of fire. This extends to consideration of how a fire might be passed on to other buildings across building lines – thus there are strict regulations regarding the fire resistance of boundary walls. As regards quality of protection the most significant issue egress time – it is important to design or understand the methods of escape within a building and the time that will be taken for evacuation, particularly along exit routes. But, another important aspect of life safety relates to the protection of firefighters rather than the safety of the occupants of a building.

Quality or extend of fire protection is defined in terms of fire resistance time – a component of structure must maintain its integrity for a special period of time e.g., a half hour for minimal protection up to four hours for some major structural members. The required fire resistance is specified by regulations and is based on a host of factors – egress times, firefighting policies, size of compartments and the available fuel that they contain, as well as the relative importance of structural members as load carrying members or as elements of specific fire protecting structures. The specification of fire resistance is thus a complex issue and is particularly open to discussion presently, because of the current evolution of fire engineering design methods and the prominence of the question of trade-off between active and passive fire protection systems

Strategic Management of e-Learning Programs in Business

Dr. Sid Ahmed BENRAOUANE

Department of Human Resources Management, University of Minnesota, USA

The technological breakthroughs that are taking place in the United States and in the industrial nations are producing structural changes that are having deep impacts on the management of organizations. Although primarily a technological phenomenon, the digital revolution is part of a broader process of social change, characterized by the globalization of markets, the shifts towards an economy of knowledge, and the invasion of technological devices into everyday life.

Drucker (1999) believes that the impact of the digital revolution on the global economy is just beginning to be felt. He compares the effects of the digital revolution to the impacts of the printing revolution of 1455, and how this revolution redefined the concept of knowledge and knowledge transfer in Medieval Europe.

Gerstner (1999) offers another analogy to express this idea. In his testimony during the National Summit on



High Technology, a hearing called by the United States congress in 1999 to study the effect of technology on the U.S. economy, Gerstner calls the current technological transformations a true revolution. He compares the effects of the digital revolution to the effects of the automobile revolution in the United States pointing out to how it redefined the concept of distance and the relationship between the workplace and the home.

Theorizing on major organizational changes that are affecting the current workplace, Block and Dobell (1999), suggest that the concept of knowledge society prompt the concept of "learning" as a key differentiator in successful organizations. In their industry report entitled "The e-Bang Theory," Block et al. believe that the move from a brawn age, which refers to the physical strength of human being, to a brain age, has left modern organizations with few options but to adopt learning as a strategic tool in order to adapt socioeconomic changes. According to the authors, two factors have affected the role of learning in organizations.

Firstly, the move from an industrial society to a knowledge society has created an interdependence between the human capital and the economy. While in the industrial age -- the old economy-- the core competency of organizations was products and services; in knowledge society, the core competency is human capital. Knowledge society puts a premium on human capital where learning becomes a competitive asset.

Secondly, as the life span of ideas and knowledge be-

came shorter, a need for training, retraining, and learning became a sine qua none condition for job performance. The fast rate, in which human skills are becoming obsolete, as Greenspan said, is requiring a faster rate in which new human skills needs to be acquired.

McLagan (1999) believes that these technological transformations and their implications on learning will deeply affect the profession of training and development. The technological breakthroughs are creating a new paradigm of learning that is putting into question the assumptions under which management training has operated thus far. McLagan warns training professionals of the threat e-learning is presenting on the structure of the profession and the design of training products.

E-learning emerged both as a product and a manifestation of these transformations. As a product, e-learning is the logical outcome of technological innovations that began with the personal computer in the 1980s and have continued with e-commerce and e-business. As a manifestation, e-learning is an expression of the broader social change that is taking place in postmodern society, which is demonopolizing access to knowledge, information, control and power.

Trends in the management field point to progressive shifts from traditional modes of training delivery to an online mode of delivery that is redefining previous assumptions about the design of training programs, learning motivations, human performance, transfer of

Study of the decomposition of some rf-sputtered Aluminium-Iron alloys

Mohamed Yacine DEBILI,

Physics Department, Badji-Mokhtar Annaba University, Algeria

The complexity of the equilibrium phase diagram of aluminium-iron, in particular on the aluminium rich side, makes difficult any forecast of the return to the equilibrium of the pulverized

deposits. For some of them, the decomposition is marked by the appearance of new intermetallic compounds resulting from the crystallization of an amorphous state.

Modeling and control analysis of PEMFC-PV hybrid power systems

Mustapha HATTI

Birine Nuclear Research Centre (CRNB), Djelfa, Algeria

PEMFC basically convert chemical energy of hydrogen directly into dc form of electrical energy. As proton exchange membrane fuel cells approach commercialization it becomes increasingly important to investigate the implementation of the new systems into conventional power systems, i.e. how fuel cells and solar cells can function as a complement to existing electricity and heat production.

In this paper, a model consisting of two energy sources (Fuel cells and photovoltaic) is proposed for one of the most promising applications is that of stationary stand-alone power systems, particularly residential located in remote areas where the cost of transporting fuel is high.

The electric generation hybrid systems are usually more reliable and less costly than the systems that use a single source of energy. The combined use of PEMFC and PV has the potential for better energy efficiency, reducing the cost of fuel cells technology, and improved fuel usage.

A very important aspect when designing a hybrid system is the determination of the most adequate control strategy. Numerous studies have developed control strategies applicable to hybrid systems.

The basic control strategy and main logical control variables for a PEMFC-PV system are described. To find a true optimum it is necessary to perform a technico-economic

optimization where the sizing of the individual system components depends on the control strategy, and vice versa. System performance indicators, parameters and constraints that can be used to analyze the performance of PEMFC-PV system have been identified.

Therefore, the dynamic behavior of each component must be carefully considered and modeled in order to ensure efficient power flow. A well-designed artificial neural network model provides useful and reasonably accurate input-output relations because of its excellent multi-dimensional mapping capability.

Artificial neural networks are computational paradigms made up of massively interconnected adaptive processing units used here for modeling and system control. They have been extensively employed in various areas of science and technology, such as process control in engineering.

This paper highlights the most important aspects of technological development of hybrid systems. We present an overview of recent work on dynamic modeling and control design for stationary PV-PEM Fuel Cells hybrid systems including the research on hydrogen storage.

The Case for Successful Outsourcing Research and Development to Algeria

Mourad TAYEBI

The University of Sydney, Australia

Rachid KAIDI

Blida Saad Dahleb University, Algeria

Mokrane IGUER-OUADA

University of Bejaia, Algeria

In the battle against declining productivity, pharmaceutical companies have generally responded by restructuring the R&D organization investing in technology tools and platforms entering into mergers and deals. More importantly, outsourcing to emerging markets is now viewed as an alternative and highly effective approach

to the innovation deficit. Hence, successful outsourcing of pharmaceutical R&D has been quietly gaining momentum. Algeria is relatively new to R&D and needs to be and 'perceived' to be very attractive to the pharmaceutical industry in order to gain its share of the market in this booming business. PHARMA will only be attracted to the country if



special emphasis is put on the models, and the benefits of outsourcing in five key areas of R&D that should include discovery research, ADMET, formulation manufacturing, full-scale manufacturing and clinical development.

Large increases are evident in the level and type of outsourcing:

- 57% of surveyed companies will outsource 20% or more of R&D operations by 2006; nearly twice as much as in 2003 (33%).
- 50% have a centralized procurement / outsourcing department for clinical development operations
- Over one-half (54%) outsourced at least 20% of ADMET in 2003, growing to 94% in 2008, with about one-half of companies outsourcing over 80% of ADMET operations by 2008.
- Outsourcing of clinical development will continue, driven by a doubling of companies that outsource over 80% of operations from 2003 to 2008. The level of outsourced manufacturing is expected to increase moderately from 2003 to 2008.

The key drivers to outsourcing for big Pharma are primarily a focus on core competency and utilization of external expertise, and secondarily, improved speed to market and improved cost productivity.

Countries like Algeria would greatly benefit, in the mid-to-long term, from attracting this type of market home as this would form the foundation for future LOCAL successful R&D operations.

Proximity and Scientific Collaboration

Oussama METATLA

Department of Computer Science, Queen Mary University of London, United Kingdom

Science is a fundamentally social process. Whether developing and exploring new ideas, planning and executing research tasks, or preparing results and findings for dissemination, social interaction and collaboration form an integral part of almost all of a scientist's research activities. We believe it necessary to approach the promotion and development of scientific

collaborations and partnerships through a deeper awareness and understanding of the sort of challenges that characterise such efforts. Thus we report herein on some relevant literature from social psychology and organisational behaviour to describe empirical endeavour that identified key aspects which influence interaction among scientists and researchers.

A major factor identified that directly impact such interaction is Proximity, as it minimises the typical problems that may arise throughout the process of conducting research, and is also likely to influence the probability of repeated collaboration. Proximity allows for frequent unconstrained opportunities for communication because it allows for increased contact, as well as provides rich interaction means that might be unavailable in its absence. Scientists who frequently communicate are more likely to develop common research interests, which in turn lead to more focused and structured communication. Such specialised interaction has the potential to result in the development of concrete ideas for collaborative projects.

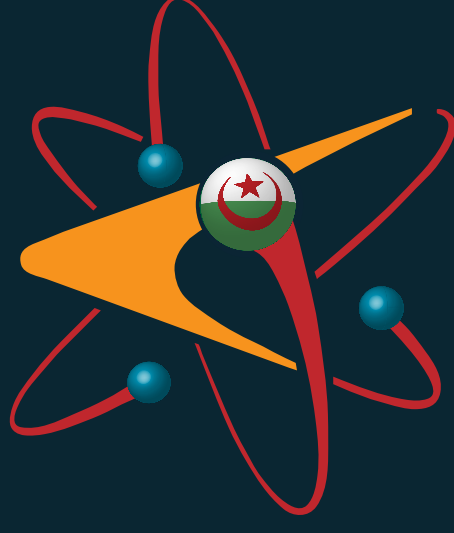
Using empirical knowledge of the function of proximity in influencing research collaborations, we discuss three key points that we consider essential for promoting and developing successful collaborations and research partnerships within institutions and across universities. Firstly, the implementation of appropriate mechanisms to take full advantage of the benefits of proximity when such factor is available. To this end, we address and exemplify the importance of proximity on both the organisational level within university departments and on the physical arrangements of such organisation, drawing on examples from current efforts employed in the author's institution to implement such mechanisms.

Secondly, We reflect on the effect of geographical proximity on scientific international collaborations both between individuals and institutions when proximity is partially or totally unavailable, and report on some methods that have been found essential to sustain appropriate levels of communication that are necessary for maintaining a lively international research community. Finally, We examine the implications of the above issues for research on the development of communication technologies to support cooperative and collaborative work in the absence of physical or geographic proximity.





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- **Dr. Ali Becherirate**, University Louis Pasteur,
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- **Bassim Karkachi**, CEO, BVision, San Diego, USA
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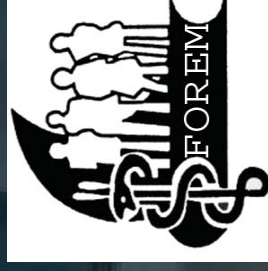
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The role of diaspora networks in technology transfer: Lessons from the Indian case

Dr. Abderrahmane BAHRI

Vice President, Bank of America, London, United Kingdom

Abstract 1

This article examines efforts aimed at tapping overseas-based skills. It explores the formation of diaspora networks as bridge institutions linking global opportunities to the local capabilities of native countries. It highlights some aspects of the Indian experience that can be replicated or adapted to the Algerian development strategy.

Abstract 2

This article tries to shed some light on the transformation that is taking place in the world economic systems. Understanding where the new world business model is heading to, is crucial in making the right decisions and choices for a new industrial strategy that is not to become obsolete in few years time.

Partnership between scientific research centres and environmental consulting services groups for better assessment of health risks

Dr. Ammar ABBACHI

Research and Consulting Services, College of Technology, Saudi Arabia

There has been a remarkable level of interest shown in environmental issues over the past few decades, with much of the emphasis placed on establishing a balanced model approach for better management of different human development activities and protection of environmental resources. Therefore, it is not surprising that different interest groups have emerged to undertake key roles in matters concerning environmental protection. Among them are Environmental

Consulting Services Groups (ECSGs), providing engineering and management solutions to environmental protection related issues. Having to address the increasing demand for their high quality services ECSGs made a closer collaboration with multidisciplinary Scientific Research Centres as their main strategy.

This paper presents a general framework within which Scientific Research Centres and ECSGs can establish joint ventures, to enhance quality of services provided to understand, manage and protect the environment through introduction of scientifically sound quantitative methods. To illustrate this new trend, the author introduced a real case study describing problems facing ECSGs while car-

rying out an environmental health risk assessment procedure for suspected contaminated sites. This assessment process based on scientific and engineering considerations in addition to factual evidences and expert judgments is still associated with a large amount of uncertainty, variability and lack of field data.

This joint venture framework would integrate the following phases in order to arrive at conclusive results enhancing the robustness of consulting services.

Identifying the major problems facing ECSGs requiring scientific research solutions.

1. To provide cost-benefit analysis for solving identified problems.
2. Developing funding procedures for scientific research projects to provide acceptable solutions to identified problems.
3. To provide implementation policy and testing facilities for lab-based scientific research findings.
4. Development of long term collaboration for better understanding of environmental issues.

However, a joint venture of this kind should not be limited to individual initiatives but should be part of the



general policy of transfer of technology from academic institutions to industrial/commercial sectors who are much in need of vigorous environmental assessment methods.

Development of engineering and construction management curricula: Goals and lessons learned through a US-Algeria educational partnership

Abdeldjalil BELARBI

University of Missouri-Rolla, USA

Abdellatif BEGHLI

Department of Civil Engineering, Abou-Bekr Belkaïd University of Tlemcen, Algeria

During the last decade, several political reforms have replaced Algeria's directed economy with a free market economy. This open market has led to new investment in industry from local, national and foreign companies; however, concepts such as engineering and construction management are required to attain the communication, training, and education necessary for new initiatives to become successful and sustainable. Algeria's strategic development has been carried out by the government in order to facilitate creation of new projects that will improve the standard of living. A very ambitious program for the next few years has been planned, with priority given to construction of new housing, an east-west highway, development of agriculture and industry, creation of infrastructure for tourism, and educational systems to support growing numbers of students. The need is particularly evident when analyzing the current educational systems in Algeria. Although governmental assistance has initiated financial support, e.g., low interest loans and tax deferrals, additional educational and technical support is required to sustain growth.

The perception remains that other countries offer superior programs in fields of engineering, mathematics, computer science, business and management, particularly at the post graduate level.

This is evidenced by the hundreds of Algerians studying at US institutions and thousands studying in France. While the number of Algerian institutions has grown and enrollment has increase over 13 times since the 1970s, qualified faculty are still in high demand, and it is estimated that over 1000 leave Algeria each year.

In addition, the percentage of working women in Algeria is only 6.7% [5], which provides an additional need

for partnership. The educational partnership discussed here has helped develop a new generation of scholars and industrial leaders that will develop their know-how in the field and provide the infrastructure to ensure the success of the strategic development programs.

Doing business in Algeria, as Algerian from abroad

Bassim KARKACHI

BiVision Systems Inc., USA

"Experience is a good school, but the fees are high" Heinrich Heine 1797-1856.

BiVision is a US based company specialised in operational knowledge transfer. BiVision encapsulates re-engineering, operation, organization, and analysis rules, than provide it to its customers in a form of enterprise application to jump start the organization and run the business based on international standard practices. This case address wireless telecom operation domain.

Led by Algerian CEO/President, after leading US cross Pacific business development, BiVision went through a whole process of reusing the expertise in penetrating the Algerian market with diligence for the last 4 years. Its president will be sharing with audience the learning from this experience.

This presentation will be structured as follow:



- Introduction
- BiVision source of inspiration, and starting point
- The Silicon Valley model
- Asian American business cross the pacific
- BiVision first stone in Algeria

Algeria is large market with huge barriers the same barriers that would stop your competition later, so

- Define your personal WHYS
- Why bothers doing business in Algerian
- The notion of completeness
- The notion of creating a base.
- Knowledge transfer origination
- Knowledge nodes and sub-nodes
- Does it have to be solely from Algerians abroad?
- How to get over “I didn’t invent it syndrome”
- How to sell Algerian market to your Board of Director & share holders.
- Why you should convince them to invest in doing business in Algeria.

- Why you should consider Algeria just as any other international business development. (Business pragmatism)
- Decoding local connotations - The role of local team.

The first inoculation start with the local team

Algerian business practices “perceptual constancy”

- Get around the local administration issues
- Legal issues
- Banking issues
- Human resources issues
- Organization silos
- Funding issues and milestones international reconciliation
- The lack of business minded middle management
- Local Education weakness (impotency in building practical and applied knowledge)
- The risk of failure, how to manage the risk

Developing world-class professional practice: the case of marketing

Chahid FOURALI

United Kingdom

The presentation will aim to highlight the importance of a marketing perspective in setting and developing businesses. The steps of the presentation will give a brief introduction about the British professional system and its key components. It will then focus on the recent work of the Marketing and Sales Standards Setting Body (MSSSB) in its attempts to set world-class standards for marketing and sales practitioners. In the UK marketing is a cross-sectoral area and as such applies to all sectors. The presentation will describe the two main stages of this work. This covers the presentation of the findings derived from a large scale occupational mapping stage that tried to understand the marketing needs of British businesses. This study showed very interesting findings that could offer pointers to the Algerian context. In particular it showed the need for developing world-class marketing benchmarks/standards to support marketers, businesses and the UK PLC as a whole. Accordingly a large-scale exercise was undertaken

to develop the sought for national occupational standards (NOS).

The presentation will introduce the marketing standards and present a number of examples in which they are being used to support organisations.

The presentation will also touch on broader ‘macrocosmic’ issues associated with the adoption of a marketing perspective. An illustration of this perspective will be given through a quick presentation of the recent developments in the British Professional system and its adoption of a marketing perspective.

The relevance of this work to the Algerian context will be highlighted throughout the presentation.



Expert System Dedicated to Industrial Maintenance

Sid Ahmed BENLAZAAR

University of Senia, Oran, Algeria

Hafida BELBACHIR

USTO, Oran, Algeria

The Industrial Maintenance is a great Research area for Artificial Intelligence applications. Our Project named CONRAD is an industrial maintenance management system.

It makes control of a remodeled knowledge data base witch is maked under control of intelligent autonomous agents, the ConRaider and ConWorm. Their Role is to ameliorate the manager decisions and make optima previsions about the decisions to make.

It is already giving results witch have been published in IEEE international Conference (IIT'06) and have been accepted for publication in a International Conference ICEIS'07 in Portugal.

Research in the computer-assisted maintenance field that is focused on the information system level or the intel-

ligent decision-making level, is primarily centred on the knowledge specificity in this complex domain. Indeed, the latter is prone to the multiple interpretations approached by the different managers with same objectivity but through often different reflections, because drowned in constraints with intra system (concerning specifically maintenance) and extra system (concerning the external environment: production, financial means, supply parts, etc.) not allowing a clear visibility the moment of the decision-making. There is therefore more than one possible option making the manager taking subjective choices difficult to appreciate while visibility is not clear. This management problem then requires knowledge space-time visualization, making it possible to foresee its changes with short medium term, function of a whole of parameters which we will try to set up in this paper

Enhancing language learning/teaching experiences through Internet technology: e-learning

Dr. Anissa DAOUDI

Exeter University, United Kingdom

In view of the significant role played by communications and information technologies in both teaching and learning, the need to adopt e-learning became vital. The Institute of Arab and Islamic Studies adopted new strategy with the main goal of creating a conceptual framework that would enable it to visualize the link between pedagogy and the use of technology from a wide perspective, bearing in mind the three main elements, the teacher, the student and technology, in class and beyond.

WebCT-Web Course Tools- is a course management system that is widely used in the U.S. and Europe. WebCT is a tool that facilities the creation of sophisticated World Wide Web based educational environments. WebCT provides a set of educational tools to facilitate learning, collaboration and communication, and a set of administrative tools to assist the instructor in the process of

management and continuous improvement of the course. In this presentation, I will attempt to expose a personal experience of using WebCT to a module of "Readings in Modern Arabic", where literary texts were handled in an interactive and lively way. Details as to how WebCT was explored will be presented. This presentation will show the practical side of using WebCT to teach Arabic literature in an innovative and interacting way

Medical imaging technologies roadmap in Algeria

Habib ZAIDI

Geneva University Hospital, Switzerland

Medical physics can be one of the most challenging and rewarding applications of physics in society today. The state of the art as far as the impact of physics on medicine can not be viewed as a uniform reality all over the world. There is, of course a wide difference in emphasis and approach where one deals with developing countries, as contrasted to developed nations. As quality assurance and cost-benefit guidelines in the practice of radiotherapy, nuclear medicine and diagnostic radiology are being developed and debated in developed countries, the perspectives of the availability and standards of health care taken for granted in these countries stand in stark contrast to the level administered in developing countries. Generally, developing countries rely on developed countries to provide training programs and all the needed equipment.

The Third World (including Algeria) tends to have a much younger population and is still underserved by medical

imaging technology. It is likely that demand for traditional radiography will continue longest in developing countries because they offer high resolution images at low cost. It has been suggested that the other modality which best meets the needs of Third World medicine is ultrasound. However, recent molecular Imaging Integrated technologies aim to generate and apply novel advanced technology for non-invasive imaging of biomolecular function in living systems and seem to have the potential to revolutionize healthcare. As developing countries find themselves able to invest in medical imaging technologies, molecular imaging technologies may be the route that they choose.

This talk sheds the light on the potential of novel molecular imaging technologies and their impact on healthcare and suggests a roadmap for implementing these technologies in Algeria in view of ongoing developments of the Cancer fight program.

On the design and learnability of an audio diagram

Oussama METATLA

Department of Computer Science, Queen Mary University of London, United Kingdom

One comes across a large variation of diagrams in many informal or formal areas of human activity. From the self-sketched sense-making drawings to the more unified notational systems of representation, graphical external representations have been proved to form an integral part of the particular cognitive activities they are used for.

With the increasing interest in developing audio tools for accessing visual artefacts, an understanding of the role these tools play, not just as accessibility solutions, but as external representational agents that support and aid cognition becomes crucial. We propose an approach for designing and evaluating audio displays that support access to graphical artefacts by assessing the extent to which they succeed to fulfil typical characteristics of external representations. A separate account of 1) how to represent the

graphically encoded information to guide the cross-modal translation process and 2) how such information is presented in the new medium is a central feature of this approach.

This suggested approach is motivated by two main observations. The first is the dominance of and bias toward visual phenomenon in the field of Cognitive Science whenever External Representations (ER) are under study. While much has been written about the nature and benefits of interacting with ERs when engaged in cognitive activities, it is quickly apparent from the literature that the focus is typically on visual and, to a much lesser extent, haptic or tactile artefacts. To our knowledge, the only references to auditory phenomenon when dealing with these sort of issues is limited to either an account for the transformation of speech from the verbal form into a transcribed writ-



ten representation, or when examining parallels between phenomenon which occur in natural language and those occurring in graphical communication. These references hardly reflect the evident and significant potential of using verbal and nonverbal sounds to communicate and represent rich levels of meaning. The second observation arises from examining the many reported evaluations of audio accessibility tools that specifically target graphs and diagrams. These studies frequently describe a certain degree of user learning and improvements taking place as a result of the practice users gain through the course of the evaluation.

Incidentally, such development of expertise forms an important aspect of interacting with external representations and a powerful means for evaluating the efficiency

of such interactive information, yet considerations for learning when evaluating audio displays for diagrammatic representations seem to be currently neglected and ignored or at best only informally addressed. We describe the proposed approach in the context of developing and audio only diagram inspection tool, the design of which relies on hierarchical structuring to organise relational information encoded in UML class diagrams. We report on the results of an experiment conducted to compare two alternative audio presentations of this structure, and present a qualitative analysis that extends existing evaluation techniques to systematically examine how a group of users learn and develop interactive expertise when using an audio diagram.

Transcriptional regulation of the Pregnane X Receptor by ligands activated transcription factors and liver enriched transcription factors

Dr. Sihem AOUABDI

ReNeuron Group plc., United Kingdom

The Pregnane X Receptor (PXR) is a nuclear receptor that mediates the expression of a battery of genes involved in the metabolism and clearance of drugs. In silico analysis of the 2200 base pairs of the proximal promoter immediately adjacent to the putative transcription start site suggests that the PXR is under the regulation of both ligand-activated transcription factors (LATFs) and liver-enriched transcription factors.

Using a reporter gene assay in human hepatoma cell lines, preliminary experiments demonstrated that the PXR proximal promoter contains regions of both positive and negative regulation, suggesting a complex mechanism of regulation for this gene. LATFs and liver-enriched transcription factors have positive and negative regulatory elements in the PXR promoter, which help maintain the homeostasis of the cell. For example, the glucocorticoid receptor, estrogen receptor, and vitamin D receptor up regulate PXR gene expression, whereas, liver enriched transcription factors HNF3 HNF4 and PXR and CAR proteins down regulate PXR gene expression suggesting that there is a feed back regulation of the PXR by itself

and by the CAR maintaining the PXR gene expression at basal levels. We have proposed a model for gene regulation of the PXR by a variety of ligands activated transcription factors and liver-enriched transcription factors. These results are consistent with our hypothesis that PXR assimilates information from many different stimuli, altering its expression in order to overcome any changes in homeostasis. The diagram shows the model proposed for the role of the PXR as a central regulator of body responses to ligands activated transcription factors stimulation.

Interestingly, we have demonstrated for the first time that PPAR regulates gene expression of the PXR by binding directly to its promoter, despite PPAR ligands not being classical PXR ligands.

These results provide further evidence for the central role of PXR as a key regulator of the body's homeostasis, gathering information from different LATFs and liver-enriched transcription factors and translating them to the system, which is regulated by this receptor.



Abstracts in French

La dimension interculturelle dans le Management des multinationales en Algérie

Dr. Rabeh LAYEB

Université Mentouri de Constantine, Algérie

A l'ère de la mondialisation et du développement des échanges, les entreprises Algériennes sont plus que jamais confrontées au problèmes de la rencontre avec des cultures différentes dans leurs activités ou relations externes ou mêmes internes. Ainsi des attitudes et des comportements fondamentalement différents, car spécifiques à la culture "locale", peuvent générer des facteurs de démobilisation, d'incompréhension et d'inefficacité organisationnelle. Néanmoins cette situation nécessite non seulement de comprendre ces différences mais il faut les accepter et les intégrer dans le choix d'une stratégie d'entreprise ou d'un style de Management adapté. et c'est pour cette raison que la dimension culturelle devienne incontournable

dans le Management des Ressources Humaines, surtout dans une économie du savoir basée essentiellement sur la compétitivité, la recherche de la compétence et de l'efficacité. La problématique que nous posons à travers cette communication est de montrer que la culture nationale et l'interculturalité sont une source irremplaçables de pérennité et même une nécessité que doivent intégrer les Managers dans leurs stratégies. Car il existe des facteurs de différenciation observables et que les principales fonctions de l'entreprise (la communication, la planification, la production, l'organisation....) dépendent du fait culturel, présent avec force aussi bien dans les relations du pouvoir, la négociation, le respect des engagements, le rapport à l'argent que le calcul des coûts.

Experts algériens sans frontières

Ali VERIN

Membre, New York Algerian Community

En utilisant systématiquement les outils internet, il est possible non seulement de contrecarrer les effets néfastes du brain-drain, mais en fait d'en bénéficier. Un forum virtuel permettra ainsi aux experts algériens de partager leur savoir en dépit des séparations géographiques. Un modèle du site proposé sera présenté ainsi que ses coûts et modes de gestion. Me. le Ministre Bedjaoui a très clairement identifié les effets néfastes du braindrain sur le développement social et économique de l'Algérie.

Le but de ce papier est de présenter une solution globale algérianisée au problème de brain-drain mettant à profit l'efficacité et la dissémination symbiotique des outils internet.

Au lieu d'être un obstacle, le brain-drain algérien en soi-même peut désormais devenir une source de progrès considérables. Pour cela un projet de site web "Expertises Algériennes" sera présenté. Le site établira un forum structuré d'échanges libres pour permettre aux "compétences" algériennes dans différentes disciplines, où qu'elles se trou-



vent de par le monde, de partager leur savoir-faire avec les algériens à la recherche de solutions ou désirant optimiser leur performance personnelle ou professionnelle.

Ainsi se créera progressivement une masse de données collaboratives (collaborative knowledgebase) émergeant de besoins algériens réels. Evidemment de multiples sites existent déjà et d'autres prennent jour continuellement. "Expertises Algériennes" sera spécifiquement modelé et dédié aux échanges professionnels et scientifiques entre algériens, pour le bien de l'Algérie.

Ce site web de haute qualité, strictement concentré sur les échanges de connaissance permettra d'établir des contacts soit personnels soit publiques entre algériens fournisseurs et demandeurs de connaissances appliquées, par disciplines – chat rooms, blogs, discussions, conférences vidéo, documents, bibliothèque de ressources, liens sélectifs.

Insidieusement et avec des effets tout aussi bénéfiques, un tel réseau créera des liens affectifs entre les participants en ravivant (virtuellement du moins) l'algérianité des experts expatriés en les exposant personnellement aux problèmes réels de leurs compatriotes.

Il existe indéniablement une conscience nationale qui a permis à l'Algérie de rayonner au cours des siècles et plus particulièrement avant, pendant et après la Révolution. La source de ce rayonnement réside dans la ressource humaine de notre peuple.

C'est cette ressource qu'il faut obligatoirement protéger et enrichir pour pouvoir résoudre les problèmes considérables qu'il nous faut maintenant confronter, y compris l'évolution sociale, la compétitivité économique, l'après-pétrole, les changements climatiques et la défense nationale.

Le paradigme de ce concept a été formulé par un noyau d'experts algériens expatriés au cours de multiples conversations à New York. Hautement spécialisés dans les finances, l'informatique, l'armement, les systèmes de contremesures électroniques, l'urbanisme, la pharmaceutique, les affaires, ils sont un exemple parmi les milliers de collègues algériens disséminés autour du monde.

Frustrés par leur isolement ils accueillent favorablement les opportunités offertes par l'initiative unique de cette conférence.

Le logiciel, une industrie à la portée des Algériens

Bachir HALIMI
Excendia, Canada

S'il y a une activité par laquelle l'Algérie peut faire son entrée dans le club des pays producteurs de technologie, ce serait le développement de logiciel. C'est à mon avis une industrie à la portée des algériens car le potentiel humain existe, l'expertise est accessible, l'argent remplit nos réserves, et Internet a éliminé les frontières douanières d'autrefois. Mais il ne faut pas se leurrer, ce ne sera pas facile. Il faut une stratégie et un plan d'action bien articulés et bien exécutés. Cela coûtera de l'argent et prendra du temps, mais les retombées en valent l'investissement.

La diaspora peut jouer un rôle important dans la conception et le lancement d'un tel projet, mais avant tout, il faut une volonté politique pour faire de l'Algérie un pays plus exportateur et moins importateur de produits en TIC. Un tel engagement doit se traduire par des mesures concrètes pour structurer le projet, le financer et lui donner le cadre qui favorise son succès par la collaboration entre les compétences nationales en Algérie et à l'étranger. C'est ainsi que d'autres pays comme l'Inde, la Chine et la Corée du Sud ont réussi à transformer le « Brain Drain » en « Brain Gain » pour développer des secteurs stratégiques. Pourquoi pas l'Algérie?

Influence des conditions opératoire sure la formation et la croissance des nano-cristaux de TiO₂ obtenus par voie sol-gel

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Des couches minces d'oxyde de titane ont été préparées, sur des substrats en ITO, par la voie sol-gel (dip-coating). Les échantillons obtenus sont caractérisés par diverses techniques d'investigations: DRX, spectroscopie Raman, FTIR, spectroscopie de potentiel électrochimique et MEB. Les observations en MEB montrent que les dépôts sont homogènes et sans fissure sur une surface assez large, et ce quelque soit la température de recuit. Les résultats de DRX et de spectroscopie Raman montrent que les mono-

couches de TiO₂; obtenues pour des vitesses de retrait comprises entre 2 et 10 cm.s⁻¹ et recuites à une température de 400°C ; sont amorphes. Par contre pour une faible vitesse de retrait 0.6 cm.s⁻¹ les monocouches de TiO₂ recuites à 400 °C sont cristallines. Les caractéristiques Intensité-Potentiel des interfaces des couches multiples exhibent un comportement de semi-conducteur de type n. Mots Clés : Sol-gel, TiO₂, couches minces, Semi-conducteur.

La collaboration université-industrie: Une expérience et des perspectives

Ali MANSRI

Université de Telemcen, Algérie

L'environnement industriel de la wilaya de Tlemcen en particulier et de la région ouest algérien en général, connaît des changements positifs en vue de se voir compétitifs et répondants aux besoins en un produit de qualité, par ailleurs fortement concurrencés par l'invasion de la production étrangère.

L'évolution de l'université algérienne a permis la forma-

tion de cadres capables d'encadrer et de développer convenablement les secteurs industriels et de services.

Dans ce contexte, nous présenterons une expérience locale de collaborations université-industrie et nous essaierons de sensibiliser les participants à un ensemble de besoins technologiques.



Centres intégrés: Rôles dans l'acquisition et le développement de la technologie

Dr. Lazhar YOUSFI

Centre intégré en fonderie et métallurgie (CIFM), Québec, Canada

L'expérience de Trois-rivières, qui est une ville ne comptant qu'environ 150000 habitants est vraiment édifiant. Forte de la présence d'un centre collégiale en formation générale et professionnelle ainsi que d'une université, cette ville qui ne compte que 150000 habitants a pu se tailler une place enviable dans l'expertise en métallurgie.

Une vision de développement conjuguée à une volonté politique a permis en 1985 la naissance d'un centre intégré en fonderie et métallurgie (CIFM). Ce centre est devenu de nos jours un incubateur de R&D et de formation pour de nombreuses entreprises fabriquant ou utilisatrice des métaux et des alliages tel que les fonderie, les usines d'électrolyse, l'aérospatial.

C'est ainsi que le CIFM s'est donné comme mission de favoriser l'émergence et la croissance d'entreprises de fabrication de produits métalliques finis ou semi-finis à haut contenu technologique. Grâce à la mise en place d'une politique de développement et d'une planification stratégique, le CIFM a instauré un effort continu pour

parvenir à jouer pleinement son rôle de moteur en expertise technique à travers toute la province du Québec et ailleurs dans le monde.

Pour le secteur de formation, le CIFM a contribué à relever le niveau technique des employés des entreprises pour lesquelles il intervient, mais aussi la qualité et la pertinence de la formation dédiée aux étudiants des programmes de technologie en génie métallurgique. Ceci est rendu possible notamment par le transfert des connaissances entre les différents secteurs d'activité. Le CIFM est un bon exemple d'instrument important pour instaurer, dynamiser et développer un secteur stratégique. Il est un bel exemple de réalisation qui s'inscrit dans les objectifs de la stratégie québécoise de la recherche et de l'innovation où le gouvernement n'hésite pas à s'associer à des projets porteurs.

La multiplication des centres intégrés sont une preuve de la réussite du concept de transfert et le développement technologique des entreprises manufacturières au Québec.

Le concept de centre de transfert de technologie: Une structure efficace de R&D au service des PME

Yacine BOUMGHAR

CEPROCQ, Québec, Canada

Le Centre d'Études des Procédés Chimiques du Québec (CÉPROCQ) est un lieu de recherche technologique qui entretient des liens privilégiés avec les entreprises. Il fournit des services de recherche et développement, du soutien technique et de formation continue spécialisée.

Les principales activités du CÉPROCQ consistent en des travaux de recherche appliquée, d'aide technique, de veille technologique et de diffusion de connaissances. Il est également en mesure d'apporter une formation tech-

nique adaptée aux besoins des entreprises. De cette façon, le CÉPROCQ contribue au développement des PME en prenant en charge le volet de recherche et de développement et de formation et de mise à niveau continu des employés.

Depuis sa création en 1996, le CÉPROCQ a conduit plusieurs projets de recherche et a développé plusieurs technologies telles que le traitement des effluents liquides avant leur rejet, le développement d'une technologie de récupération de métaux précieux présents en faibles quan-

tités dans les résidus miniers et métallurgiques, le développement de produits de santé naturelle et de bien d'autres technologies et techniques répondant directement à des problématiques industrielles spécifiques qui, souvent, constituent des goulots d'étranglement de production des PME. Ainsi, un véritable partenariat structurant se construit avec les PME.

La présentation a pour objet d'expliquer l'efficacité d'une telle structure ainsi que son adaptabilité et son opérabilité dans le contexte

Structures financières et développement: Quels sont les choix pour l'Algérie

Ramdane DJOUDAD

Department Monetary Policy Division, Bank of Canada

L'objet de notre étude est d'évaluer pour l'Algérie, les choix stratégiques à effectuer entre une structure financière basée sur les marchés de capitaux et une structure basée sur le développement de l'intermédiation bancaire. La réforme financière en Algérie devrait être guidée par deux facteurs importants: 1) Les expériences passées d'autres pays et les pratiques actuelles dans les pays émergents; 2) Les besoins de financement spécifiques liés à la nature de la structure économique en Algérie. Il est d'ailleurs primordial de mettre en relief ces besoins et de juger des voies les plus efficaces pour y répondre.

Notre étude va s'effectuer en trois étapes. D'abord, nous parlerons du rôle de l'intermédiation financière dans le développement économique, en analysant les causes de la synergie entre le système financier et le système économique. Ensuite, nous définirons ce que nous entendons par structures financières, en abordant notamment l'histoire des pratiques financières de certains pays ainsi que les pratiques actuelles dans les pays émergents. Finalement, nous nous interrogerons sur les facteurs qui devraient conditionner nos choix pour l'Algérie, pour enfin donner une appréciation de ce que devraient être ces choix.

Gestion du savoir et réseaux de compétences par l'intégration technologique

Dr. Nassim LAKHAL

CITAM, Montréal, Canada

L'intégration des NTIC dans la gestion et la capitalisation de la connaissance constitue un volet d'action important au niveau des nouvelles approches de développement des réseaux de compétences. Depuis déjà quelques années, le secteur de l'éducation universitaire et professionnelle considère la maîtrise et l'utilisation des nouvelles technologies de l'information et de la communication comme une composante de la démarche visant l'acquisition des compétences liés à la majorité des fonctions de travail au sein de l'entreprise.

Devant la rapidité de l'évolution de la technologie et son influence sur les pratiques éducatives, de nouveaux outils de support à l'enseignement et à la gestion de la connaissance ont vu le jour, on débatera donc lors de cette conférence des tendances pratiques et perspectives des modèles de gestion de savoir dans les communautés scientifiques, ainsi que de la nouvelle tendance vers les applications de télé-collaboration ou des réseaux coopératifs à distance, le partage des compétences et le transfert du savoir (expérience Nord américaine et particulièrement canadienne).

On abordera dans un second plan une présentation d'un outil technologique de gestion de savoir pour un réseaux composé de communautés scientifiques distantes, durant laquelle on présentera une étude de cas réel d'une plateforme logicielle de télé-collaboration / système coopératif d'aide à la gestion du savoir et à la capitalisation de la connaissance.

La sévérité des problèmes amène certains pays arabes (même s'ils sont producteurs de pétrole) à se tourner vers les énergies renouvelables pour tenter de diversifier leur approvisionnement énergétique. Ces formes d'énergie comprennent l'énergie solaire thermique et photovoltaïque, des stations hydroélectriques et éoliennes pour l'approvisionnement en électricité, le pompage de l'eau et d'autres applications agricoles par le séchage solaire; la conversion de micro-organismes de plantes par biomasse pour en extraire des produits énergétiques tels que le méthanol et l'éthanol; le chauffage et le rafraîchissement des habitations par des procédés naturels.



Ces technologies énergétiques sont suffisamment développées pour pouvoir être adoptées dans les plus courts délais par les pays arabes pour la seule raison que ces pays se trouvent entre le 35 degrés nord et 35 degrés sud parallèles dans la zone ensoleillée. Cette communication décrira les différentes sources d'énergies renouvelables et le transfert de nouvelles technologies pouvant être utilisées pour la création des communautés auto-suffisantes.

Project Proposal

The Algerian Academy of Science

IBScientific

United Kingdom

An academy of the sciences is a learned society, the role of which is to promote the scientific research by making possible the meeting of certain eminent researchers. The academy encourages and protects the research spirit, and contributes to the progresses of the sciences and of their applications. The academy of the sciences participates in scientific life and supports by:

- The quick publication, in its scientific series and reports announcing important and novel findings
- Competitive funding opportunities for researchers
- The organization of symposia, preferably on multidisciplinary themes, in cooperation with Institutions or other academies.
- The conservation in the archives, of documents emphasising the history and the progresses of the Algerian scientific thought.

Aims

- Act as umbrella for Algerian science (students, scientists, institutions, businesses and policy makers).
- Provide a platform for standardisation of scientific research funding, implementation and application in Algeria.
- Provide the Algerian science infrastructure with a base to start investing and best using its human and economic potential.
- Help provide a standard framework for science-based companies.
- Provide an opportunity for Algerian scientists to meet and exchange expertise.
- through the organisation of general and specialised conferences and seminars of international standing.
- Create a bridge between Algerians scientists abroad and their counterparts in Algeria, and link all of them to the worldwide science.

Building the academy

All Algerians are called to contribute and cooperate to build this academy including:

- Being members of the academy and spread the word.
- Being active and taking part in its institutionalisation inside and outside Algeria
- Being active and provide funds for its activities

Membership

Membership to the academy is open to all Algerian scientists as full members in these categories: Student member, Junior research member, Senior research member.

Honorary membership is reserved to scientists with international standings and are usually invited to be part of its advisory or non-executive board. Organisation and management of conferences and seminars

Associate members are non-Algerians who are willing to be part of this academy

Frequently asked questions

Is the academy only for the sciences? No it is also for technology, engineering, social sciences and the arts.

Is the academy part of IBScientific? The academy is not part of IBScientific, however, IBScientific is proposing the academy as a future project to provide Algeria with an institution that provide sustainable development of scientific sector, and promote knowledge-based society and economy.

Will IBScientific take part in building the Academy? Yes, IBScientific will work hard to gather the Algerian scientists willing to create such a sustainable institution.

What is my role, then? To cooperate with all Algerians working hard to establish the academy in the near future.

For more information

To be part of this academy and receive more information about the role you can play, please contact us.

<http://www.aascience.org>

info@ibscientific.net



Created to Preserve

Preview by: **Sofiane NACI**

The Computer Laboratory
Cambridge University
United Kingdom



Despite its advanced degradation, the Casbah of Algiers is still a place much popular to visit by tourists travelling to Algeria. Its crumbled walls indeed narrate the history of the local ancestors.

While visiting The Casbah, one realises how much the memory of the people of Algiers has been jumbled, and amputated from a heritage buried in a chronic amnesia. Very few youngsters know the history of this city in cascade that refreshes itself from the Mediterranean breeze in nostalgia of its golden age. It was necessary for the city to become ruins for those persons in charge to think about to save the “ksours”, the palaces, and their drained fountains, at least as a gesture to recognise the architectural and historical heritage of the city.

Wondering around the city, no one can ignore the majesty of its architecture, inspired from the Ottomans. The houses are narrow and tall, with corbelled floors supported by wooden props and internal patios decorated with ceramics and marbled columns, making of the Casbah a unique kind of medina, or Islamic city.

Although an ordinary visitor to the medina might think that it is impossible to be inhabited in the modern era, the layout of the streets and houses of the Casbah had strong reasons behind it. The Casbah is the vestiges of a traditional urban structure associated with a deep-rooted sense of community, and represents the architectural identity of Algiers, with all its cultural, religious and social influences.

In this issue of IBScientific Magazine, Fardeheb elaborates this point further [REF]. The author gives an overview of the social and religious practices that influence the choice of architecture, including layout and materials. Taking the Arab countries as an example, where these social and religious prerogatives are deeply rooted in the

population, Fardeheb highlights the importance of a suitable architectural design and shows how this can influence the private and communal life of the inhabitants.

Architecture is a fast moving subject, due to the many factors that influence its direction. Traditionally focusing on people's needs and climatic conditions, recent trends have become more significant to architectural design, where materials, costs, and fast execution are more important. Sticking to the example of Algiers, a visitor can instantly notice the invasion of modern buildings, mostly in fashionable European eclecticism, Mediterranean, or even Northern

European, styles. While this gives the city a modern look and feel, it is often coupled with uncomfortable living conditions that contradict the living styles of the local people, be it socially, economically or religiously. Fardeheb [REF] also shows how the inappropriate use of modern technology, often found in Arab countries, can badly damage the image of the city and its people. One of the main reasons of this, he adds, can be blamed on the improper architectural education and lack of local governments support. This inevitably yields to slow loss of identity due to cultural invasion.

Fardeheb concludes the article by

pointing to some possible solutions to this problem. He stresses the need for finding a new balance between architecture and technology, with the sole aim of preserving the Arab and Islamic identities. It is nowadays crucial to synthesize traditional values with modern technologies rather than incorporate superficial ornaments and embellishments because after all, architecture creates to preserve.

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1. F. Fardeheb, *IBScientific Magazine*, vol. 3(1), pp. 18-23, 2007.



Appropriate Architecture for the Arab Population of the Mediterranean Basin What does the future hold?

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This paper presents the problems encountered by local North African governments, their efforts and mistakes in trying to implement an architecture that has brought a great deal of divergence and controversy to today's society. This is the direct result of significant demographic expansion, urban migration and economic difficulties. This has led most Arab countries of the Mediterranean Basin into a chaotic situation where the increase in population is greater than the house building activity. Large scale housing projects by government agencies using prefabricated elements and foreign architectural models started to be built. This transfer of technology and ideas is made to the detriment of the local population which cannot pay the price for a cultural and architectural alienation. This paper will focus on the current social prerogatives, the need for an appropriate technology and the understanding of the local needs. Recommendations will be provided to ensure a proper balance between existing values and future needs. What is required is the establishment of a new architecture that is suitable for a contemporary Arab society and based on simplicity of construction, durable identity and human scale and flexibility.

Introduction

In search of optimum design strategies, some Middle Eastern architects have opted for a radical return to traditional Islamic forms in the design of modern cities and buildings for the Arab world. This comes in response to, first, architects who have designed dwellings in Arab cities using architectural principles of the Modern Architectural Movement and second, to awaken the architecture of the Islamic World and bring it to a revival. This ideological tendency is not valid in the light of today's economic situation and life style.

Other architects such as Skidmore, Owings & Merrill have completely ignored the past and transposed plans from the West that are better fitted to industrialized Western societies. A typical example exists in the Persian Gulf countries where new cities emerged in the middle of sand dunes and their skylines resemble the one of Atlanta or Chicago. More skyscrapers are being built in Dubai than in any city in the United States. These designs have been translated to an Arab-Islamic environment with no means of social or climatic adaptability. The high rise buildings in the middle of the desert must consume an enormous amount of electricity to be cooled and protected from the high solar load.

Both ideologies fail to effectively respond to an Arab society in a state of transition searching for a new identity and a suitably built environment. Echoing the past is not recommended because today's needs are different and turning to the West for architectural solutions and high technology that are inappropriate for developing nations is also misleading. The challenge is to find appropriate technologies based both on Western and local knowledge with design schemes that are characteristic of traditional Arab living patterns and Islamic architecture.

Social Prerogatives

Some of the early social standards that prescribed the form at the settlement scale such as the position of the mosque (direction toward Mecca), the market or the separation of men's and women's quarters are still discernible today in North African rural architecture where strong cultural convictions still prevail. The spatial need for such a population is very clear: for cultural reasons deeply rooted in religion, the requirements for the inward looking house predominates as opposed to the Western style outdoor looking house frequently sought by urban dwellers.

Problems in adjusting to city life remain with those urban dwellers who are recent migrants and who are still embedded with traditional values. The government cannot provide adequate housing and health services to the uncontrolled growth of such populations living at the fringe of the society. The housing shortage created by the

increasing rural migration and the rapid demographic development has forced governments to produce fast, efficient housing. Architects are faced with a dilemma: how to design quickly for a society divided between a faction seeking the fulfilment of a private, traditionally driven life and those advocating modernity and progress. Time pressure, strict planning and design regulations do not offer the architects flexible design solutions.

An attempt to reconcile traditional social needs in a contemporary project was made by the late Egyptian architect Hassan Fathy. When the architect was given the authority to design dwellings for the New Gourni village in inland Egypt in 1947, he could not assimilate himself to a Gourni peasant nor could he understand their spatial needs. However, the new dwellings he designed had a cultural and environmental relevance and answered the specific needs of a rural population. Fathy's scheme for New Gourni reflected the need for individual privacy in the use of the courtyard and distribution vis a vis the rest of the house. He also stressed the need for privacy outside the dwelling with a hierarchical organization of street patterns. He used wooden screens (Mashrabiya) to diffuse light and sun penetration as well as a wind catcher in the design of a local school. He also used local building materials and revived Nubian techniques as to lay domes and vaults over rooms without scaffolding. At first, Fathy's efforts were not recognized by the bureaucrats in Egypt because they considered it a sign of decay to go back to vernacular architecture to answer a contemporary housing problem.

There have been some attempts of the same nature by George Candilis in the 1950s to develop a model for mid-rise apartments to house migrants from rural areas. One project was built in Casablanca, Morocco in the form of walk-up apartments with balconies of double ceiling heights to create courtyard-like spaces. The architect took into consideration privacy concerns and promoted natural ventilation patterns. This model, established to alleviate the housing shortage in Morocco and create an ideal prototype for the Moroccan Muslim population, failed for several reasons. One of the reasons why the project failed is because the buildings did not reflect the users' social needs. There was no outside living space (courtyard) and that the only exterior living space, the balcony was not part of the local custom. After a few weeks, the residents started modifying the spaces and semi-open balconies were closed and cross ventilation openings blocked out.

The Need for an Appropriate Technology

Technological innovations and economic development have brought drastic changes in the standards of living in North African and Middle Eastern countries. However, they have not successfully answered social needs in the

design of new housing for Arab societies.

The housing shortage is increasing every year because of the demographic explosion that is afflicting every Arab country, except for the Gulf countries.

In addition, there is a shortage of finances and building materials in the poorer Arab countries. The availability of cement and steel (which are the commonly used building materials) is limited due to an economic crisis and its transportation is very costly. What results is housing projects that take twice or three times more time to complete.

When traditional buildings were erected, they were meeting the requirements of everyday living conditions and culture, and locally available materials played an important role in the construction of vernacular buildings. In wooded areas, timber was used; earth or stone were the main building materials in non wooded areas. These dwellings have however obvious disadvantages and do not meet today's construction standards nor are they resistant to rain, time and earthquakes. For example, earthen walls were too thick and the amount of earth needed to build the house was considerable. Earthen walls one meter thick have the thermal resistance as 10 centimetres of concrete and are easily damaged by rain. Moreover, the high thermal inertia of these earthen walls and roofs radiate heat to the inside spaces on summer nights leading local residents to sleep outdoors on the roof.

There have nonetheless been successful buildings in hot and arid climates using a technique called the double roof system which can be traced back to indigenous builders. This strategy consists of a light upper roof that acts as a parasol and which is separated from the roof that allows free air circulation. This system eliminates the need for cooling by mechanical equipment.

A blend of simple, low cost techniques and materials and modern knowledge is crucial to produce very viable construction means that could alleviate some of the housing problems facing Arab countries in North Africa (e.g., Algeria).

The challenge in the short term is to search for a judicious implementation of an intermediate level of technology to increase the structural and thermal performance of local materials.

Innappropriate Use of Modern Technology

After the independence of the North African countries, internationally known architects were called by the leading governments to design and build large scale projects such as airports and universities using the latest technology to put these countries into the mainstream of eco-

nomie development, progress and prestige. A few of these projects remain unfinished today due to an excessive cost of construction and the dependency on imported materials and technology. These projects represented a field of experimentation for European, American and Japanese architects. In Algeria, for example, the Brazilian architect Oscar Niemeyer designed Mentouri Constantine University, in 1969, at the invitation of then president Houari Boumedienne and the Algiers School of Architecture using plain concrete architecture. Kenzo Tange from Japan designed two university campuses in Oran and Algiers. The American firm Skidmore Owings and Merrill built apartment complexes in Blida, near Algiers. Before and during the French occupation, large scale projects were erected (some of them by Le Corbusier), none of which responding to cultural norms for Algerians.

Up to now, the architecture in the North African countries is still in a stage of crisis because most of the commissions are still given to Western firms. For example, the University of Petroleum and Minerals in Dhahran, Saudi Arabia was designed by the American firm of Caudill, Rowlett and Scott and reflects only foreign style and ideas with no intent to respect or revitalize local architecture. Young, native architects cannot compete with international firms and there is even a sentiment of disdain from local authorities toward local architects because they don't think that they have the know-how and expertise. This is one of the reasons why very talented architects and engineers have left their home country to work in Europe or in the United States.

The international firm of Skidmore Owings and Merrill has made an exception to the rule and has built the international airport of Jeddah, Saudi Arabia using the latest technology: all the project was designed using a state of the art computer aided design system, prefabricated elements and a special manufactured fiberglass membrane exclusively conceived for this project. Most pleasing about this project is that it is an image of the traditional Bedouin tent and since the tent acts as an exhaust chimney no air conditioning is required in one terminal. It is therefore possible to use modern technology to solve contemporary problems and at the same time, relate to the social and physical environment. The Jeddah airport won the Agha Khan award for the integration of modern technology and traditional language.

Unfortunately, what frequently occurs is that at a residential scale, traditional elements and ornaments are inserted into the façade of a building to give the illusion of Arab identity. Such is the case of the Dhahran airport by Yamasaki.

Lack of Cohesion and Proper Architectural Education

When native North African architects are asked to design housing projects for the local population, the design does not fulfill basic social and spatial requirements because architectural education is derived from Western schools lacking the emphasis on cultural values and stressing Western design principles. When the projects are completed, there is a lack of cohesion in the architectural vocabulary. Instead of following hierarchical social and spatial patterns in the design of communities that were common characteristics in traditional Arab cities, the residents find their doors leading directly for the public domain with no concerns for privacy for the women or security for the children. The living spaces that are created have no respect for human scale and become socially and climatically unacceptable: wide, unshaded vehicular streets, "villas" that cannot operate without air conditioning, large outdoor open spaces that collect dust and sand. This is because architects are not trained in their own traditions. When they have a knowledge of their traditions and culture, they tend to reject it as old fashion or decadent.

When the frustrated architects do not find any proper identity or support in their own country, they leave to practice in foreign countries. The most successful Arab architects, Abdelwahad El Wakil, an Egyptian and Mohamed Saleh Makiya, an Iraqi, have their offices in London and contribute tremendously to the preservation of Islamic architectural values in their projects that are mainly for North African and Middle Eastern countries. El-Wakil has acknowledged the importance of the Egyptian architect Hassan Fathy to his design development. Examples of El Wakil's work includes El Sulaiman Palace in Jeddah and Qubbah mosque in Medina.

This attitude can be corrected only if architecture educators change the way architecture is taught in Arab countries. There is a need to modify architectural education and put an emphasis on local identity and cultural values rather than on being slaves of international modernism.

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Possible Solutions

After the acknowledgement of the misunderstanding by foreign architectural firms as well as by local architects and the lapse into a crucial economic crisis, the governments of North Africa and the Middle East are starting to promote an architecture that is a midway balance between new or appropriate technology and the preservation of certain Arab traditions.

It is true that we cannot go back to the morphological structure and lifestyle of the traditional medina as the ideal model although this urban form fulfilled social needs and responded to climatic requirements. There have been some tendencies in Morocco and Tunisia where a political movement encouraged the resurgence of past, Arab-Islamic forms. This goal was not totally attained since it only reinforced traditional Islamic patterns on new buildings in the form of textured arcades and facades, misplaced ornaments and bastardized the essence of Islamic form planning.

The current goal is to show the need for a new architecture that would first, retrieve the lost cultural identity in Arab countries and second, synthesize traditional values with modern technologies rather than incorporate superficial traditional Islamic ornaments and embellishments.

There have been instances where architects such as Charles Bocarra, a native of Morocco, who took captivating actions, started building with concrete and turned to brick and mud because the latter materials cre-

ated an architecture that blended with the local environment in Morocco.

Conclusion

Success in designing for Islamic societies can only come after a deep understanding of traditional Islamic architecture, its antecedents, meanings and possibilities because of the need for an objective and scientific rather than emotional comprehension of traditional architecture. This will make architects and students of architecture bet-

ter understand their local architecture and speak the same language as the population they are building for. What is needed is an architecture that is in harmony with the traditional cultural values and an appropriate technology, an architecture of synthesis. Examples of models on how to achieve such an architecture is indicated in a book by Margaret Bentley Sevcenko and titled: Theories and Principles of Design in the Architecture of Islamic Societies.

The accumulated experience and wisdom of a local region should not be ignored because it is the basis for a cultural identity and it is through culture that man manifests his presence in this world. On the other hand, the mass of

knowledge and technology coming from the West should not be ignored. What is needed is the establishment of a new architecture that is suitable for a contemporary Arab society and based on the simplicity of construction, cultural identity, human scale and flexibility.

In the same context, there needs to be serious planning strategies from government agencies to preserve the quality of those traditional cities which have not been destroyed but are under a constant threat of demolition. This should be undertaken for the perpetuation of a cultural and architectural heritage that is necessary in architectural education.



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